CLAIMS

What is claimed is:

1. A communication system configured to communicate information in real-time between remote locations, comprising:

a portable camera apparatus including:

a video camera configured to capture video signals;

a voltage regulator configured to regulate voltage received from a battery source and providing a regulated voltage to the video camera; and

a transmitter configured to transmit the video signals captured by the video camera from one location to another remote location; and

a receiver apparatus including:

an antenna array having a plurality of antennas, wherein individual ones of antennas of the antenna array are configured to receive the video signals transmitted by the transmitter; and

a receiver device configured to be disposed adjacent the antenna array and configured to scan the video signals received by individual ones of the antennas of the antenna array, and wherein the receiver is further configured to establish a lock on a video signal in response to signal strength of the respective video signals received by the individual ones of the antennas of the antenna array.

2. The system of claim 1, further comprising:

a monitoring unit configured to monitor the video signals received by the receiver apparatus.

3. The system of claim 1, wherein the camera apparatus further comprises:

an encoder configured to encrypt video signals output from the video camera prior to transmission; and

a bypass switch configured to selectively control routing of video signals captured by the video camera either to the encoder or directly to the transmitter for transmission.

4. The system of claim 3, wherein the camera apparatus further comprises:

a battery;

a laser flashing apparatus disposed adjacent to the video camera, the laser flashing apparatus including:

a laser pointer to enable a remote monitoring user to identify a frame of reference in an image captured by the video camera; and

control circuitry configured to control the laser pointer to periodically turn-on and turn-off in order to conserve energy drawn from the battery and supplied to the laser flashing apparatus.

5. The system of claim 1, wherein the voltage regulator is configured to generate a plurality of regulated voltages comprising first and second regulated voltages.

6. The system of claim 5, wherein the first regulated voltage is provided to the video camera and the encoder.

7. The system of claim 5, wherein the second regulated voltage is provided to the laser flashing apparatus.

8. The system of claim 1, wherein the receiver apparatus comprises:

a second transmitter configured to further transmit the video signals output from the receiver; and

an antenna configured to transmit the video signals received from the second transmitter.

9. The system of claim 8, wherein the first mentioned transmitter is configured to transmit video signals at about 900 MHz, and the second transmitter is configured to transmit video signals at about 2.4 GHz.

10. The system of claim 8, further comprising:

a second receiver apparatus configured to receive the video signals transmitted from the second transmitter; and

a monitoring unit communicatively coupled with at least one of the first mentioned receiver apparatus and the second receiver apparatus to monitor video signals received from the first mentioned receiver apparatus and the second receiver apparatus, the monitoring unit including:

a decoder configured to decode the received video signals; and

a display device configured to display video signals decoded by the decoder.

11. The system of claim 10, wherein the second receiver apparatus comprises an antenna having a gain of at least 14 dB.

12. The system of claim 10, wherein transmission range between the first mentioned receiver apparatus and the second receiver apparatus is greater than 4 miles line-of-sight.

13. The system of claim 10, wherein the monitoring unit further comprises:

a device configured to split a video signal decoded by the decoder into first and second signals, the first signal provided to the display device configured to display the first signal, and the second signal provided to a video recording device configured to record the second signal;

a battery configured to provide power to the monitoring unit and the first mentioned receiver apparatus and the second receiver apparatus; and

a charger configured to receive power supply from an external source to charge the battery.

14. The system of claim 1, wherein the camera apparatus is disposed in a waterproof housing.

15. The system of claim 1, wherein the voltage regulator comprises a booster circuit configured to boost voltage from a first level to a higher second level.

16. The system of claim 1, wherein the receiver device comprises a tuner configured to tune the receiver device to a select transmission frequency.

17. The system of claim 1, wherein the transmitter is configured to convert video signals from the video camera into RF signals prior to transmission.

18. The system of claim 1, wherein the receiver device is configured to convert RF signals into video signals.

19. The system of claim 1, wherein the individual ones of antennas comprise a patch antenna having a gain of at least 8 dB.

20. The system of claim 1, wherein transmission range between the camera apparatus and the receiver apparatus is about 2200 feet line-of-sight without encountering signal degradation.

21. The system of claim 1, wherein the video signals are transmitted in analog mode.

22. The system of claim 1, wherein the video signals are transmitted at a power level of about 200 mW.

23. A communication system comprising:

a portable camera apparatus including:

a video camera configured to capture video signals; and

a transmitter configured to transmit the video signals captured by the video camera;

a receiver apparatus including:

an antenna array having a plurality of antennas, wherein individual ones of antennas of the antenna array are configured to receive video signals transmitted by the transmitter; and

a receiver device disposed adjacent the antenna array, wherein the receiver is configured to scan the video signals received by individual antennas of the antenna array, the receiver device further configured to establish a lock on a video signal having a highest signal strength from among the video signals received by the individual antennas, and wherein the video signals from the transmitter are transmitted at a frequency of about 900 MHz.

24. The system of claim 23, wherein the camera apparatus further comprises:

an encoder configured to encrypt the video signals received from the video camera prior to transmission by the transmitter.

25. The system of claim 23, wherein the receiver device comprises:

a second transmitter configured to further transmit the video signals received by the receiver device.

26. The system of claim 25, wherein video signals from the second transmitter are transmitted at a frequency of about 2.4 GHz.

27. The system of claim 25, further comprising:

a second receiver apparatus configured to receive the video signals transmitted by the second transmitter; and

a monitoring unit configured to receive video signals from at least one of the first mentioned receiver apparatus and the second receiver apparatus, the monitoring unit including:

a decoder configured to decode the received video signals; and

a display device configured to display decoded video signals.

28. A communication system configured to communicate information in real-time between remote locations, comprising:

a portable camera means comprising:

a camera means for capturing video signals;

means for regulating voltage received from a battery source and providing a regulated voltage to the camera means; and

a transmitter means for transmitting the video signals captured by the camera means;

a receiver means comprising:

an antenna array means having a plurality of antennas for receiving the video signals transmitted by the transmitter means; and

a receiver means disposed adjacent the antenna array means for scanning the video signals received by individual antennas of the antenna array means, and wherein the receiver means is further configured to lock onto a video signal having a highest signal strength from among the video signals received by individual antennas of the antenna array means.

29. A portable camera configured to wirelessly transmit video signals in real-time to a remote location, comprising:

a voltage regulator configured to regulate voltage received from a battery source;

an encoder configured to encrypt the video signals prior to transmission;

a transmitter configured to transmit the video signals captured by the camera; and

a module comprising:

a light source configured to identify a frame of reference in an image captured by the camera; and

circuitry for controlling the light source to periodically turn-on and turn-off in order to conserve energy drawn from the battery source.

30. The camera of claim 29, wherein the video signals are transmitted at about 900 MHz.

31. The camera of claim 29, wherein the light source comprises a laser pointer.

32. A communication method for communicating information in real-time between remote locations, comprising:

regulating a voltage received from a battery source provided in a portable video camera;

providing a regulated voltage to the video camera;

capturing video signals using the video camera;

transmitting the video signals using a transmitter;

providing an antenna array having a plurality of antennas to receive the video signals transmitted by the transmitter; and

scanning the received video signals using a receiver device disposed adjacent the antenna array, the receiver device configured to scan individual ones of antennas of the antenna array and establish a lock on a video signal in response to signal strength of the respective video signals received by the individual ones of the antennas.

33. The method of claim 32, further comprising:

selectively encrypting the video signals received from the video camera prior to transmission from the transmitter.

34. The method of claim 33, further comprising:

disposing a laser flashing apparatus adjacent the video camera to enable a remote monitoring user to identify a frame of reference in an image captured by the video camera; and

controlling the laser flashing apparatus to periodically turn-on and turn-off in order to conserve energy drawn from the battery.

35. The method of claim 32, further comprising:

providing the video signals received by the receiver device to a monitoring apparatus;

decoding the video signals received by the monitoring apparatus; and

displaying decoded video signals on a display device of the monitoring apparatus.

36. The method of claim 32, further comprising:

further transmitting the video signals received by the receiver device using a second transmitter;

receiving the further transmitted video signals in a receiver device of a monitoring apparatus;

decoding the video signals received in the receiver device of the monitoring apparatus; and

displaying the decoded video signals on a display device of the monitoring apparatus.

37. The method of claim 32, wherein transmitting the video signals comprises transmitting the video signals by the first mentioned transmitter at a frequency of about 900 MHz.

38. A communication method for communicating information between remote locations, comprising:

capturing signals using a video camera;

transmitting the captured signals using a transmitter comprised in the video camera;

receiving the video signals transmitted from the video camera using an antenna array having a plurality of antennas;

providing a receiver device adjacent the antenna array;

scanning the video signals received by individual ones of antennas of the antenna array to determine a video signal having a highest signal strength among the received video signals; and

locking onto a video signal having the highest signal strength, and wherein the video signals from the transmitter are transmitted at a frequency of about 900 MHz.

39. The method of claim 38, further comprising:

encrypting the video signals captured by the video camera prior to transmission by the transmitter.

40. The method of claim 38, further comprising:

further transmitting the video signal having the highest signal strength;

receiving the video signal of the highest signal strength in a second receiver;

decoding the video signal received in the second receiver; and

displaying decoded video signals on a display device.

41. The method of claim 40, wherein the further transmitting is performed at a frequency of about 2.4 GHz.

42. A method of remotely monitoring a hazardous environment, comprising:

providing a water-proof camera apparatus in the hazardous environment to capture and transmit video signals of the hazardous environment;

receiving the transmitted video signals in a receiver apparatus via an antenna array having a plurality of antennas; and

scanning the individual ones of antennas of the antenna array using the receiver apparatus to establish a lock on a video signal having a highest signal strength among the received video signals.

43. The method of claim 42, further comprising:

further transmitting the video signal of the highest signal strength using a transmitter located in the receiver apparatus;

receiving the further transmitted video signal in a second receiver apparatus; and

displaying the received video signal.

44. The method of claim 43, wherein the further transmission of the video signal is performed at a frequency of about 2.4 GHz.

45. The method of claim 42, wherein the captured video signals are selectively encrypted prior to transmission.

46. The method of claim 42, wherein transmission of the captured video signals is performed at a frequency of about 900 MHz.